PLANT IMMIGRANTS

No. 216

GENERA REPRESENTED IN THIS NUMBER

Illustrations

United States Department of Agriculture
BUREAU OF PLANT INDUSTRY
OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION

WASHINGTON, D. C.

ANNOUNCEMENTS OF IMPORTANCE TO ALL EXPERIMENTERS.

During the past two years Joseph F. Rock has been traveling in Yunnan, China, where he has collected many rare and beautiful species of Rhododendron. Seeds of these have just been received at Washington, and are ready for distribution to experimenters who desire to test them.

The collection contains many distinct species and varieties: It is, without doubt, the most extensive which has ever been secured from that part of the world. In forwarding it, Mr. Rock wrote, "I made a special effort to get as many as possible. They are really wonderful. You have no conception of the variety; some form dense mats over acres of ground, the whole one mass of rich crimson. Do not think of them as shrubs with flowers of various shades of pink; each one has an individuality of its own, and they should prove an endless stock for the breeder."

Some of these plants come from elevations of five or six thousand feet; some from much higher regions. Those which Mr. Rock secured on mountain passes at elevations of twelve thousand feet, where snow covers the ground for considerable periods annually, are likely to prove fairly hardy. Others will probably not succeed where winter temperatures lower than twenty above zero are experienced. There are regions on the Pacific slope, as for example the cool, moist coast of southern Oregon and northern California, where many of these rhododendrons ought to luxuriate. It is doubtful if any of them are sufficiently hardy for New England. The mountainous regions of the Carolinas and other southern states may provide satisfactory conditions.

If you have soil which has proved suitable for rhododendrons in general, and are equipped to handle the propagation of such plants, we will be glad to forward seeds of Mr. Rock's varieties for you to try. Since they will not be included in the general distribution next winter, these seeds can be sent only to those who apply for them immediately.

This number issued July ....., 1924.

Plants recently received, not yet available for distribution.

CITRUS GRANDIS (Rutaceae), 58457. **Cecily grapefruit.** From Amanzi Estate, Uitenhage, Cape of Good Hope. Plants presented by Alan Fitzpatrick, at the request of Sir Percy Fitzpatrick, London, England. This variety originated at Amanzi, as a sport or mutation from the Walters grapefruit. The latter originated in Florida, where it was formerly one of the principal commercial sorts.

Sir Percy describes this mutant as differing from its parent in being "practically devoid of seeds." If it retains this characteristic in the United States, it will be of much interest to test it alongside our own seedless variety, the Marsh. The transplantation of the Walters grapefruit to South Africa, the development there of a form superior in being nearly seedless, and its return to the United States in this improved condition forms an interesting tale. When we asked Sir Percy what name he had given to the mutant, he wrote "among ourselves we call it 'Cecily,' after my daughter who had the good fortune to discover it." With his consent, we are adopting this name for use in the United States. Because of the quarantine against all plants of the genus Citrus, it will be some time before the variety can be tested in Florida and California, but it will be sent to those two states as soon as possible.

CROTALARIA ANAGYROIDES (Fabaceae), 58466. From Buitenzorg, Java. Seeds presented by Dr. P. J. S. Cramer, director, General Experiment* Station, Department of Agriculture, at the request of Charles L. Hoover, American consul, Batavia, Java.

The crotalarias are tropical leguminous plants, of value for cover crops and green manure, for which purposes they are used in the same manner as cowpeas and velvet beans. Dr. Cramer writes that *Crotalaria anagyroides* has proved more desirable than other species in Java, mainly because it produces a larger amount of foliage, and the plants remain erect. He says: "It is especially satisfactory at high altitudes, and is in such great demand for the tea plantations in the higher mountains that we have to limit our seed distributions to small quantities."

Though cultivated in Java, this species is not native to that part of the world. It is widely distributed in tropical America, where it occurs, according to Grisebach, from Mexico to Peru, and in the West Indies. It is said to be somewhat shrubby in character, with erect puberulous stems and leaves composed of three ovate-lanceolate leaflets.

CROTALARIA sp. (Fabaceae), 58635. From Angola, Africa. Seeds presented by Merlin W. Ennis. "In our experiments with various plants introduced for cover crops we did not discover anything satisfactory, so we turned to the plants growing wild in this region. Among these was the 'Elende clover,' of which we are sending you seeds. This is a

rather inconspicuous plant which grows in all sorts of places. I tried it first as a cover crop in the orange grove, in the hope that it might restrain the Bermuda grass. It not only smothered the Bermuda grass, but as it appears now in its second year it has made a very heavy stand. As the plant is well supplied with root nodules I believe that it will prove valuable as fertilizer." (Ennis.)

FICUS CARICA (Moraceae), 58643. **Dottato fig.** From Saonara, Padua, Italy. Plants purchased from Fratelli Sgaravatti. This variety, well known in parts of Italy, has been introduced at the request of the Office of Crop Physiology and Breeding Investigations, for trial on the Pacific Coast.

Dr. Gustavus Eisen, long with this Department, and instrumental in bringing about the introduction of many fig varieties into the United States, describes Dottato as the best known fig of Tuscany. A large proportion of the figs exported from Italy are of this variety. The tree is said to love rich, moist soils, and is not suitable for dry lands. Under proper environmental conditions, it is a strong grower and heavy bearer of medium-sized fruits, oval-pyriform in shape, smooth, and yellowish green in color.

HORDEUM sp. (Poaceae), 58530. **Naked barley.** From Kansu, China. R. C. Ching, who accompanied F. R. Wulsin, of the National Geographic Society, during his recent exploration of Kansu Province, northwestern China, has sent to this office seeds of many plants collected in that remote region. He has supplied the following note regarding the barley represented by this number: "The Tibetan barley is very hardy, and is usually grown at an altitude of more than 10,000 feet, where other cereal crops do not thrive. It is sown in early April and harvested at the end of September, and is the staple cereal crop of the inhabitants of the Kansu-Tibet border."

MALUS SYLVESTRIS (Malaceae), 58464. **Apple.** From Simla Hills, Punjab, India. Scions presented by S. E. Stokes. "A russet apple of good size and excellent flavor, greatly appreciated in Simla by the English. The tree, which is a strong grower and heavy cropper, ripens its fruit in October, and we have often been able to keep it until April or May. While in storage the fruit turns to a golden yellow. At the altitude of 7,000 feet in Kotgarh, where this tree grows, many other temperate crops are also grown, such as potatoes, corn, and barley, and such fruit as cherries, plums, and apricots." (Stokes.)

PYRUS sp. (Malaceae), 58512. **Pear.** From Simla Hills, Punjab, India. Seeds presented by S. E. Stokes. In connection with the Department's endeavor to find the best stock plants for the cultivated pears

of the United States, many wild forms are being secured from Asia. J. F. Rock has sent in a large number from Yunnan (see Annual List of Plant Introductions, 1923-1924), and others are being obtained through various channels. This one from Mr. Stokes is accompanied by the following note: "This Himalayan wild pear is called 'shegal' or 'kanth' by the natives. The fruit is bronze-colored, perfectly round, and the size of a large cherry. The tree grows extensively in the mountains at altitudes of 4,000 to 8,000 feet."

RUBUS SAXATILIS (Rosaceae), 58640. From India. Seeds collected by Ralph R. Stewart, (No. 7467. Baltal. September 3, 1922).

Mr. Stewart describes this as a hardy species found in half-shady situations at an altitude of 9,000 feet. "The drupelets," he says, "are tart but very large, the largest of any Rubus in this region."

According to Sir Joseph Hooker (Flora of British India), *Rubus saxatilis* is distributed throughout the Himalayan region, commonly at altitudes of 10,000 to 11,000 feet. The stems are short, erect, annual from a stout woody rhizome. The leaves are composed of three ovate, somewhat lobed, acutely double-toothed leaflets, each 2 to 3 inches long. The white flowers, half an inch in diameter, are followed by fruits composed of a few large scarlet drupelets.

Judging by its distribution in Asia, this species should prove sufficiently hardy for cultivation in many parts of the United States. It is of interest mainly to plant breeders who are working with this genus.

SPATHODEA NILOTICA (Bignoniaceae), 58467. From Entebbe, Uganda. Seeds presented by the Chief Forestry Officer, Forestry Department. *Spathodea campanulata* is proving to be an ornamental tree of unusual value for southern Florida. For this reason, the arrival of another member of this genus is a matter of considerable interest. *Spathodea nilotica,* which hails from the upper Nile Valley and the Belgian Congo, is described as a bushy tree reaching about 20 feet in height. The leaves, which are opposite and composed of 9 to 15 leathery leaflets, are covered beneath with dense, short hairs. The scarlet flowers are produced in short, compact terminal clusters. They are said to resemble closely those of *S. campanulata,* which means that they are strikingly beautiful. The behavior of this tree in southern Florida will be watched with interest.

TRITICUM TURGIDUM (Poaceae), 58548. **Poulard wheat.** From Kansu, China. Seeds presented by R. C. Ching. While carrying on botanical explorations in Kansu, northwestern China, Mr. Ching discovered that Sinkiang wheat was being cultivated in that region. His comments follow: "The Sinkiang wheat has just been introduced into western

Kansu and its yield has been much greater, I was told, than the native varieties. The head is somewhat triangular, being broad at the base. This variety is now growing in a very limited area at an altitude of about 7,000 feet, and is sown either in the spring or fall."

An Avocado from the Republic of Colombia.

The region about Santa Marta, Colombia, produces many fine avocados (*Persea americana*) of the West Indian race. The trees are not cultivated as in Florida, but occur here and there in banana plantations and dooryards. Because of the extremely hot climate, the fruits ripen some weeks earlier than they do in the West Indies. This has resulted in shipments from Santa Marta being the first to reach American markets at the beginning of the avocado season. Sometimes they have arrived in New York during the month of May, though it is doubtful if avocados picked at that time are fully mature.

While past experience shows that it is impossible to forecast the behavior of an avocado, when it is taken from one region to another, the possibility of securing early-ripening varieties of the West Indian race from Santa Marta has long been under consideration. No one has been able to say definitely that the earliness of most varieties in that region is due solely to climate, though personally I feel this to be the major factor, and perhaps the only one of importance.

While studying the avocados of that region in August, 1920, I came across a tree which was said to be unusually valuable. It was growing in the dooryard of the superintendent's house at Esperanza Farm of the United Fruit Co., near Rio Frio. My notes made at the time are reproduced below:

"This tree flowers in December. Fruit begins to ripen in April, being the first to mature of the varieties hereabout. The main crop is in April, May, and June, but a few fruits may remain on the tree until August. Sometimes the tree flowers a second time, and ripens 20 to 30 fruits in December. It is a good bearer, yielding at least 500 avocados annually.

"The fruit is oblong-oval in form, and weighs about a pound and a half. The surface is light yellow green, marked with numerous small yellowish dots. The skin is firm and moderately thick, and the flesh buttery, fine-grained, deep yellow (tinged with green near the skin), without any trace of fiber or discoloration, and of rich, very pleasant flavor. The proportion of flesh to seed is much larger than is common, the flesh being about an inch thick on the sides of the fruit. The seed is small, and quite loose in the seed cavity, which also is small."

The variety, when introduced into the United States, was given the name Fernandez, in honor of Joaquin B. Fernandez, at that time manager of the Santa Marta Division of the United Fruit Company. Young trees propagated at Washington have been sent to Florida, where they are making

PARENT TREE OF THE FERNANDEZ AVOCADO.

(*Persea americana* Mill.; S. P. I. No. 51105.)

This tree, which stands in a dooryard in Rio Frio, near Santa Marta, Colombia, yields annually more than 500 fruits, each weighing about a pound and a half. The principal crop ripens in April, May, and June. Usually a second and smaller crop matures in December. (Photographed by Wilson Popenoe, August 3, 1920; P18018FS.)

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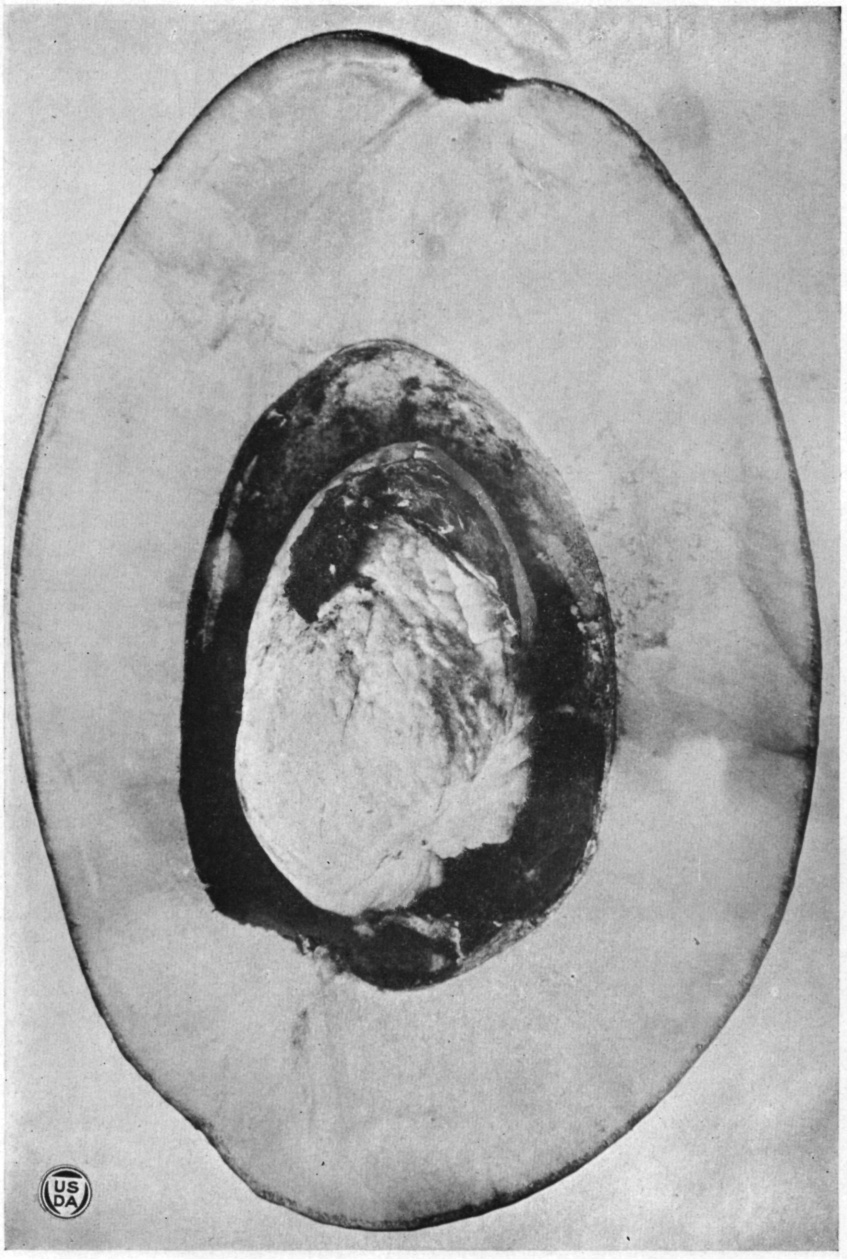
Pl. 352.



AN EARLY-RIPENING AVOCADO OF THE WEST INDIAN RACE.

(*Persea americana* Mill.; S. P. I. No. 51105.)

The Fernandez avocado from Rio Frio, near Santa Marta, Colombia, has been introduced for trial in Florida, where it seems likely to ripen somewhat earlier in the season than most of the West Indian varieties now cultivated in that State. The fruit is of large size, attractive appearance, and excellent quality. It has been named in honor of the late Joaquin B. Fernandez, manager of the Santa Marta Division, United Fruit Co. (Photographed by Wilson Popenoe, August 3, 1920; P18020FS.)

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excellent growth. There is no reason to suspect that they will not prove adapted to that region, since the variety appears to be a straight West Indian, and this race is known to thrive in southern Florida. As to the season of ripening, however, it is unsafe to make a prediction. If it should happen to precede other West Indian varieties by two or three weeks, it would be of unusual value; if it is no earlier than other sorts now grown in Florida, it may still be worth growing, because of the excellent appearance and quality of the fruit.

Wilson Popenoe

New Chestnuts and Related Trees from Southwestern China.

One of the objects of J. F. Rock's agricultural explorations in western China was to secure new and promising chestnuts and related species for introduction into the United States. His search in the province of Yunnan brought to light a number of interesting forms, some of which have been successfully introduced into this country and are now being carefully nursed with the object of establishing them here.

This bit of exploration carried on by Mr. Rock illustrates some of the difficulties met with in such undertakings. The province of Yunnan is a remote part of western China, lying north of Siam and on the northeastern border of India. The country is difficult of access, and when once entered, traveling is not without serious hardships. It is a region of magnificent mountains, high plains, small and large valleys, deep gorges, and rushing waters. The climate is unlike anything we have in this country, but if the southern part of Florida could be elevated so that considerable areas were from 5,000 to 15,000 feet above sea level we might have something approaching conditions as they exist in Yunnan. The temperatures, even at the high elevations, are never very low, but snow is common. It would seem likely that the species of Castanea or chestnut and of Castanopsis, which is closely related to the chestnut, secured by Mr. Rock, may find a congenial home in portions of the South where our own native chestnut grows, and possibly also on the Pacific Coast, notably the cool humid sections such as that around Eureka, in northern California.

The northeast corner of Mississippi, the northern half of Alabama, and about one-third of Georgia bordering on Alabama and Tennessee constitute the southern portion of the territory covered by our native chestnut.

Chestnut blight is continuing its ravages and is gradually encroaching on the remaining forests found in the Southern States. It is too early to say that the chestnuts discovered by Mr. Rock are blight resistant. We are hoping that this may be the case. Anyway, they have characters which make them promising and worthy of trial here.

The material available is very limited and must be handled with great care to insure its establishment and utilization for seed production, breeding work, and other purposes. One of the first problems will be to determine the susceptibility or non-susceptibility of these new introductions to blight. This will require careful experimental work extending over several years.

Mr. Rock began collecting chestnuts in August, 1922, and continued through the months of September, October, November, and December of that year. He also collected one lot in the autumn of 1923. All the nuts were carefully packed but were subjected to a long and hazardous journey lasting from five weeks to two and a half months. Owing to the danger of introducing new crop pests, the nuts were further subjected to a severe trial through certain treatments it was found necessary to give them on their arrival. The 24 numbers secured by Mr. Rock probably represent six different species, four being Castaneas or chestnuts, and two Castanopsis. Eleven of the lots introduced are now growing but have not advanced beyond the small seedling stage. The following notes on them are submitted:

55984. CASTANEA sp. The nuts of this chestnut were collected in September, 1922, and received in Washington November 21, 1922. The trees were found wild in the valleys of the Haitung Range at an altitude of about 8,000 feet. The nuts are of large size, being about twice as large as our native American chestnut. According to Mr. Rock, the nuts are sweet and of a delicious flavor. This chestnut appears to be related to *C. mollissima,* or hairy chestnut, found in eastern China and which has been introduced several times. This chestnut is one of the most promising Chinese types. It is resistant to blight and furnishes a good edible nut. The tree begins to bear early and lends itself well to orchard culture. The seedlings from Mr. Rock's introduction appear hardy as far north as Washington, D. C.

56081. CASTANEA sp. Seeds collected in September, 1922, and received December 6, 1922. The tree, according to Mr. Rock, grows to a height of 50 feet and has a straight trunk 1 to 2½ feet in diameter. The nuts were collected at an altitude of 8,200 feet. The tree is said to be healthy. The nuts are sweet and delicious and are larger than the usual run of Mr. Rock's Castaneas. They are about two-thirds the size of our native American chestnut but shaped something like large kidney beans.

56130. CASTANEA sp. This chestnut was collected in the vicinity of Tengyueh, Yunnan, in October, 1922, and received in Washington in December, 1922. It is a small nut, resembling somewhat our native chinquapin. We have no data as to the size and character of the trees. The leaves of our seedlings are 3 to 4 inches long, light green above and silvery gray below. The edges of the leaves are smooth, apex long and narrowly tapering.

56677. CASTANEA sp. According to Mr. Rock this is a fine tree growing 60 to 100 feet high with trunks 4 to 5 feet in diameter. The burs occur in spikes and the nuts are small and sweet, something like a chinquapin. The leaves are obovate, about 3 inches long and 1½ inches wide. They taper rather abruptly at the base and have a rounded apex. The margins are coarsely sinuate. The veins on the lower surface are prominent.

56768. CASTANEA sp. This is a fine lofty tree 80 to 100 feet high with a trunk 3 feet in diameter. According to Mr. Rock, the smooth, fawn-colored bark is flaky, and the straight, ascending branches give the tree an oblong appearance. It is said to be one of the finest forest trees of the region. It is found at an altitude of 6,000 feet. The nuts are small, resembling those of the chinquapin. In the seedling stage the leaves of this chestnut resemble very closely those of S.P.I. No. 56130. They are lanceolate, 3 to 5 inches long and about one inch wide at the widest part. The edges are smooth, base broadly tapering, apex narrow and long.

56777. CASTANEA sp. This is another small-fruited Castanea with more or less triangular nuts. It was collected November 12, 1922, and received January 18, 1923. There is no information as to the size and character of the tree. The leaves of the seedlings are small, 1 to 1½ inches long, light green above and below, lanceolate with faintly sinuate edges.

56296. CASTANOPSIS sp. A tree growing 70 to 80 feet in height. The nuts were collected on the slopes of the Likiang Snow Range at an altitude of 10,000 feet. Collections were made in October, 1922, and received in Washington February 2, 1923. The nuts are small, resembling small acorns; they are said to be sweet and edible.

56297. CASTANOPSIS sp. According to Mr. Rock, this is one of the finest and largest species of Castanopsis in Yunnan Province. It reaches a height of 80 feet and has a diameter of 2 to 3 feet. The nuts were collected at an altitude of 8,000 feet. It is a fine timber tree, free from disease. Mr. Rock's collections were made in November, 1922, and were received in Washington February 2, 1923. The nuts are quite small, resembling small acorns, and are edible and sweet.

56300. CASTANOPSIS sp. A tree 60 to 80 feet high with a trunk 2 to 3 feet in diameter, found at altitudes of 7,000 to 8,000 feet. The nuts are small, more or less triangular and flattened. They were collected in November, 1922, and received in Washington February 2, 1923. According to Mr. Rock the nuts are sweet.

56489. CASTANOPSIS sp. This is a fine tree growing 60 to 80 feet tall with a straight trunk 2 to 3 feet in diameter. The nuts were collected at an altitude of about 7,000 feet. They closely resemble small chestnuts, being at first brown, then becoming black. They are also sweet and edible. The genera Castanopsis and Castanea are closely allied and differ chiefly in their flowers.

When it was found that some of Mr. Rock's chestnuts, secured in 1922, were failing to germinate, he was requested to make another attempt to secure some of the more important of the forms sent in the previous year. It was not practicable to do this but in September, 1923, Mr. Rock succeeded in securing a good supply of nuts of a Castanopsis, which may be briefly described as follows:

58394. CASTANOPSIS sp. A semideciduous tree growing 50 to 70 feet tall, with trunks 4 to 6 feet in diameter. The nuts were collected at an altitude of 8,200 feet and were received in excellent condition. Germination good. The nuts resemble in shape medium-sized acorns and are said to be sweet and edible. According to Mr. Rock, this is one of the finest and hardiest timber trees in the region. The young seedlings are vigorous growers and promise to give us a collection of fine trees.

B. T. Galloway.

FOREIGN SEED AND PLANT INTRODUCTION

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